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A BINET SCALE FOR THE BLIND.[1]

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PREFATORY NOTE.

THE Binet-Simon Scale is almost too well known to require description. It consists of a series of questions or problems arranged more or less in order of difficulty, and grouped according to the ages at which, as ascertained by experiment, children of average intelligence can pass them. A child of eight who can pass all the seven-year questions and none higher, is said to have a mental age of VII years. If he also answered three eight-year and two nine-year questions, his mental age would be VIII years—five scattered problems being considered equivalent to one complete year. The whole series forms a measuring scale by which general intelligence (as distinct from school knowledge, though some of the questions imply school knowledge) can be measured. The scale has been found very useful in practice for distinguishing mentally defective children from children who are merely dull and backward; for classifying the mentally defective; and for testing juvenile delinquents.

The interest excited by the Binet Scale has had highly fruitful results in stimulating research into the whole subject of tests of intelligence and capacity. When America "came into the War," the psychologists were mobilised and all recruits were subjected to a series of tests with the object not merely of eliminating the unfit, but of preventing square men getting into round holes. The latest claim for tests is that it is a "business proposition" for any firm employing a thousand or more workers to include a psychologist on the staff for the purpose of selecting the most suitable candidates, and of passing these on to the department in which their natural aptitude will be of greatest service to the firm.

The complete Binet-Simon Scale, with full directions, will be found in *Mentally Defective Children*, published by Arnold, London.

[1] This paper formed the basis of a thesis for the degree of M.D. of the University of Edinburgh, and is published by permission of the University and of the Medical Research Committee. The author is indebted to the Committee for a Grant.

A Binet Scale for the Blind

Part I.

In the beginning of 1915 the writer published, in *The Braille Review*, a paper on the Binet-Simon Tests, advocating the formulation of a scale of tests applicable to blind subjects. The chief object of the paper was to invite the co-operation of teachers in schools for the blind in seeking and trying tests which might prove suitable for the purpose. Although this paper was received with interest, its main object was unsuccessful, as those teachers who felt themselves qualified for the task suggested were too busy to undertake it. However, the principals of the schools named below were most sympathetic, and willingly provided the writer with every facility for examining the children under their care.

The problem of formulating standard tests for measuring the intelligence of the blind had already begun to excite interest in America, and Mr Irwin, Director of the Education of the Blind for the State of Ohio, drew up a list of tests which he arranged tentatively as probably suitable to various ages. Thus from four to eight tests were suggested for each year of age from 3 to 10, and for the ages of 12, 14, 16, and 18. He also issued a schedule for recording the marks of the subjects tested based upon the "Point Scale Schedule" of Yerkes and Bridges.[1] This schedule contained twenty-two tests arranged in the supposed order of difficulty. The tests in the Yerkes-Bridges Schedule which were unsuitable for blind subjects were replaced by other tests.

The point scale method of recording observations upon the intelligence of the blind has been tested by Thomas H. Haines,[2] who examined a considerable number of blind persons, and published his results in an elaborate monograph in 1916. Haines recommends a few alterations in the tests in Irwin's Schedule, and a considerable alteration in the order of the tests. He also details his experience with a number of tests not included in the point scale, and makes various suggestions with regard to the formulation of a year scale. Unfortunately, Haines examined very few young children. Out of 142 blind subjects tested, only four were under 9 years of age.

[1] *A Point Scale for Measuring Mental Ability*, by Yerkes and Bridges. Warrick & York: Baltimore, 1915.

[2] *Mental Measurements of the Blind*, by Thomas H. Haines, M.D., Psychological Monographs. Psychological Review Co.: Princeton, N.J., 1916.

The present paper deals solely with the formulation of a year scale.

The Problem.—Blind children at the time they come to school are frequently found to be very backward in their physical and mental development, owing to errors in their early training. The natural tendency of anyone who has charge of a young blind child is to do everything possible for the child, not only to obviate the risk of accident but with the idea of compensating the child in some degree for his misfortune. In some cases foolishly excessive precautions are taken, to the extent even of keeping the child in bed for years. Treatment of this kind, however well meant, is prejudicial to the child. The normal child "grows by doing," and unless the child is allowed to do things for himself he will not grow at the normal rate or in the normal way. Thus it often happens that a blind child at the age of 7 or 8 years of age is extremely timid about finding his way about even in surroundings that should be familiar; is extremely clumsy in the manipulation of such articles as a spoon or cup; and is quite unable to button his own clothes or tie his own boots. In some cases, children whose physical activities are markedly behind the normal have yet a good knowledge of language and converse as freely as the average child of the same age; but in other cases, where the guardians have not recognised the necessity of talking to the child and taking him about, the capacity for speech may be limited to mere baby-talk, and the understanding of the child may be so limited as to make him appear imbecile. Hence blind children who are merely backward in their development run the risk of being regarded as mentally defective, and indeed it by no means infrequently happens that such children are actually certified as defective.

There are differences of opinion as to whether children who are both blind and mentally defective should be trained in a school for the blind or in an institution for the mentally defective. Probably the answer depends upon the degree of mental defect present. However that may be, it is obvious that a serious mistake is made when a blind child who is backward in mental development but is not feeble-minded is consigned to an institution for the mentally defective, where he cannot receive the kind of training which teachers of the blind are able to give, nor the stimulus which results from intercourse with other blind children who are physically and mentally his superiors.

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When a blind child who is suspected of being mentally defective is placed in a school for the blind, it does not usually take an experienced teacher long to discover whether the child is really feeble-minded or simply backward in intelligence. But it would obviously be useful for those who have to decide whether a blind child is or is not mentally defective *before* sending him to an institution, to have some simple means of finding out. It has been suggested that the Binet-Simon Scale of Intelligence Tests might serve such a purpose if it were adapted to the blind. Binet himself states that one of the chief uses of this scale is to distinguish between the child who is really mentally defective and the child of normal capacity who appears to be defective because for some reason or other his mental development has been retarded. He claims that children whose mental development has been so retarded as to result in their appearing to be mentally defective are frequently able to pass the tests suitable to their age. Consequently he lays down the rule that every child reported as defective by a teacher should be tested, and if he succeeds in passing the tests corresponding to his years, he is intelligent and must be treated as a normal child, but under a different teacher and preferably in a different school.

A Criticism.—The object of the present research is to establish a Binet Scale for the blind. Yet it must not be taken for granted that such a scale once established will be as useful in distinguishing between defective and backward blind children as in the case of seeing children. The success of the Binet Scale depends upon the justifiable assumption that all normal children have certain experiences and opportunities in common. All normal children, for example, have frequent opportunities of observing the primary colours and of learning their names. By the time a certain age is reached one may count upon the child being able to name the colours. No doubt some children, such as those who have their attention specially drawn to colours in a kindergarten or a Montessori school, may learn to name colours at an earlier age than those who do not have such opportunities. But the opportunity comes to all within a comparatively restricted period, and consequently Binet has been able to utilise the ability to recognise and name the primary colours as a test which children of a certain age *ought* to be able to accomplish.

Of blind children it is impossible to predicate a similar

uniformity of experience. As we possess no traditional method of training blind children, such children are subjected to very diverse methods of treatment, and consequently derive very diverse impressions from their environment. Moreover, the term blind child is a very indefinite one, including children who cannot see at all, children who can see in various degrees, children who have been blind from birth, and children whose mental development was aided by normal sight for various periods.

What is a Blind Child?—For the purpose of the present investigation any child whose sight is so defective as to make him a suitable pupil for a school for the blind has been considered a blind child. In the schools visited the teachers were asked not to submit for examination any children they considered feeble-minded. Otherwise the children were taken without selection. It was very apparent that the differences referred to above had a great influence upon the ability of the children to pass some of the tests. Children who have had normal sight for a number of years and have then become blind, *e.g.* as the result of an accident, have a very different mentality from children who have never been able to see. Such children continue to use visual images, and these assist them greatly in tackling some of the tests, such as Binet's card puzzle. Other children again, though nominally blind, retain a sufficient amount of sight to assist them in the same and similar tests. Several children in each school visited could recognise and name colours.

Since the above was written Haines has also drawn attention to the importance of taking these differences into account in endeavouring to formulate a series of tests suitable for blind subjects.

Four groups of subjects may be distinguished in institutions for the blind:—1. Those whose vision is sufficiently good for the Binet tests for sighted persons. 2. Those whose vision is insufficient for some of the ordinary tests, but who can see their way about or can distinguish wooden cubes placed on a white background, and can thus perform the Knox cube tests. 3. Those who are totally or almost totally blind, but who lost their sight at a sufficiently late date to continue to use visual imagery. 4. Those who are totally or almost totally blind, but who lost their sight at such an early age as to possess no useful visual imagery.

These groups (somewhat differently defined) are recognised by Haines, who suggests quite arbitrarily that the age of five years should be taken tentatively as separating groups 3 and 4.

Schools visited.—Through the courtesy of the principals, practically all the children in the Royal Blind Asylum School, Edinburgh, and Henshaw's Blind Academy, Old Trafford, Manchester, were tested, while in the School of the Blind Asylum, Glasgow, all the children were tested up to the age of eleven. Altogether 100 blind children were tested, of whom four were excluded as mentally defective or too nervous to be fit to be tested. In addition, 88 sighted children were tested with certain tests with their eyes closed.

Tests used.—Besides the Binet tests, a number of additional tests were used, as detailed below. Some of these were original or were suggested by friends, others were obtained from various sources, especially from a list drawn up in connection with an investigation at present proceeding under the auspices of the Board of Education of the State of Ohio. The children were tested individually in a quiet room, and all the children appeared to be quite at their ease with the exception of those mentioned above as having been excluded.

Standardisation and Grading of Tests. — It is very important to avoid personal variations in the use of tests; otherwise comparisons between the work of different observers are without value. Unfortunately, in some cases Binet's own directions are somewhat vague. In the scale subsequently given in detail more definite instructions are given when necessary.

With regard to the tests in the Binet Scale, two things require to be determined in respect to each test: (1) whether the test is a suitable one for blind subjects; and (2) whether the test should be graded for the same age as in the case of sighted children.

1. It is an interesting fact that one can obtain a very good series of tests suitable for the blind, simply by eliminating from the ordinary Binet Scale all those tests which for their accomplishment require sight. At least three of Binet's tests for each age can be passed successfully by blind subjects. Some of these tests, however, are much more difficult for the blind. The recognition and naming of the coins in ordinary circulation, for example, can be accomplished by a few blind people, but by so few of even the older children that this test

must be excluded from the scale. The other test with coins, which involves giving change for a shilling, must also be excluded. It is an easier test than the other, but very few blind children succeed in passing it, partly owing to the difficulty in distinguishing the smaller coins by touch, and partly because blind children do not gain the early familiarity with money which is the lot of ordinary school children who from a very early age are accustomed to accompany their mothers to shops and to be sent messages which necessitate the bringing back of change.

2. With regard to tests which can be accomplished by blind children, it is obvious that we ought not to take for granted that any test in the Binet Scale is properly placed for the blind. Each test must be tried upon a number of intelligent children, and its place in the scale determined by the result. There is no unanimity as to what proportion of children of a particular age must pass a given test before that test can be graded as suitable for that age. Binet himself is quite vague as to his own procedure. In some cases he says a test is suitable for a particular age because at that age "all the children pass it." In other cases he says "most of the children pass it."

When tests which have already been graded for sighted children are applied to the blind, it seems reasonable that the place of these tests in the scale should not be changed too readily, seeing that we wish to compare the intelligence of the blind child with that of sighted children. Moreover, the children met with in a school for the blind differ from the children met with in an ordinary school in that a larger proportion of them are below the average in their intellectual endowments, and a larger proportion have been retarded in their mental development by gross errors in their early training. For these reasons I have considered a test suitable for a particular age if it could be passed by a simple majority of the children examined. This procedure seems the more justifiable from the fact that the small numbers of children available of a given age might yet contain two or three who were obviously dull and stupid, and whom no one would have selected as fair specimens of the blind child of that age. Of course the grading of the tests in the scale is purely tentative. It will have to be revised by the testing of much larger numbers of children, who must be selected by the teachers who know them as being of fully average intelligence.

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Tests from the Binet Scale suitable for the Blind.—The following tests from the Binet-Simon (1911) Scale have been found suitable for the examination of blind children. Several of the tests, however, will require to be shifted to other years.

Binet Tests suitable for the Blind.

Age.	Test.
III	1. Can show eyes, nose, and mouth.
	2. Repeats two figures.
	4. Knows name.
IV	1. Tells whether a boy or a girl.
	2. Names common objects, *e.g.* a boot, a spoon, a plate.
	3. Repeats three figures.
V	1. Tells which is heavier of two weights.
	3. Repeats a sentence of ten syllables.
	4. Counts four pennies.
VI	1. Tells whether morning or afternoon.
	2. Defines common objects in terms of use.
	4. Counts thirteen pennies.
VII	1. Shows right hand or left ear.
	3. Executes a triple order.
	4. Tells value of three pennies and three half-pennies.
VIII	1. Tells differences between objects from memory.
	2. Counts backward from 20 to 0.
	4. Knows day and date.
	5. Repeats five figures.
IX	2. Defines objects in terms higher than use.
	4. Names the months in order.
	5. Gives sensible answers to simple problems.
X	1. Arranges five weights in order.
	3. Sees absurdity in certain statements.
	4. Gives sensible answers to certain problems.
	5. Makes a sentence to include three given words.
XII	2. Makes a simpler sentence containing three given words.
	3. Gives sixty words in three minutes.
	4. Defines abstract words.
XV	1. Repeats seven figures.
	2. Gives three rhymes to a given word.
	3. Repeats a sentence of twenty-six syllables.
	5. Explains an incomplete account of some incident.

Additional Tests:—1. THE TRIANGLE.—Material: a flat piece of wood in the form of an equilateral triangle with sides 3½ ins. long. Six straight pieces of stick about 6 ins. long—*e.g.* six hexagonal pencils—round pencils being apt to roll out of place.

Say to the child, "Take this piece of wood and feel it carefully to find out its shape. Then take some of these sticks and

lay them on the table so as to show me the shape of the wood." The child may spend half a minute in examining the wood, but must not be allowed to feel it again after laying it aside. If the sticks are laid so as to form a recognisable triangle, the child is marked +. The corners need not be absolutely accurate, but should be nearly so.

This test is very instructive to the examiner, as it brings out very distinctly the difficulty blind children have in manipulating material, and also how little they appreciate form as compared to sighted children of the same age. Any young blind child who accomplishes this test easily and expeditiously will probably be found to have become blind at a period subsequent to infancy, or to retain a sufficient amount of sight to be able to form visual images of forms.

Sighted children succeed with this test at quite an early age, though tested with their eyes shut. Thus of fifteen 6-year-old children so tested, twelve were successful; of twenty-two 7-year-old children, eighteen were successful; of fifteen 8-year-old children, fourteen were successful; and of fifteen 9-year-old children, all were successful. Among blind children complete success is not found till the age of fourteen, *i.e.*, at that age all those tested were successful. These children were studying mathematics and had thus become familiar with triangles. Of younger blind children the passes were: at 8 years of age, two out of eight; at 9, four out of nine; at 10, eleven out of eighteen; at 11, seven out of eleven; at 12, seven out of nine; at 13, seven out of ten.

Blind children often appear impressed by the points of the triangle, and arrange two sticks thus ⊥.

2. THE SQUARE.—This test is similar to the last, but a square piece of wood with sides measuring 4 inches is used instead of the triangle. This test is slightly more difficult than the triangle, but not much. Blind children often attempt to make the form by laying the pencils side by side. When they have put all the pencils in place they seem satisfied.

3. THE DIAMOND.—This test is the same as the last except that the piece of wood used is diamond-shaped instead of square. Its angles measure 30° and 60°. This test is more difficult than the two former. At fourteen years of age all the blind children tested were successful, but at earlier ages the proportion of successes was much smaller than in the case of the triangle and the square.

These are useful tests, but it is not possible to grade them in terms of Mental Age owing to the wide range of individual differences. At 13 years of age only four children out of ten were successful with all three tests, yet one child of 6 years was successful. This latter child, however, was in advance of his years, his mental age being at least eight. He was expert in the use of his hands, and passed the test of arranging five weights, which Binet assigns to the age of 10.

4. ÆSTHETIC TEST.—This test is intended as a substitute for Binet's test of recognising the prettier of two faces.

Material required: six pieces of cloth each about 4 ins. square, viz. coarse canvas and tweed; silk and stout linen; velvet and serge. All should be of the same colour, preferably dark. Give the child each pair in turn and say, "Feel these and show me which feels nicer." In a later series of observations the following are used, as suggested by Irwin:—(*a*) Serge and silk, (*b*) velvet and serge, (*c*) velvet and carpet.

5. PUZZLE TEST.—This is simply a modification of Binet's card puzzle, which he assigns to the age of 5 years. The test may be carried out according to Binet's directions, but blind children naturally find it much more difficult than sighted children. The test may be modified by using very stout card, and handing the pieces to the child instead of laying them on the table. The pieces should be superposed with the right angle of one opposite the right angle of the other, thus This, of course, necessitated turning one of the pieces over, which doubtless makes the test a little more difficult.

Instead of card one might use thin pieces of wood, which would be easier to handle, and if the test were carried out in accordance with Binet's instructions one side of the pieces might be bevelled at the edges, or markedly roughened all over one side, so that the child might notice if he turned a piece over accidentally. Binet himself directs that if the child turns one of the pieces over accidentally the observer should reverse it again.

The advantage of using card is that the material for the test can always be procured readily.

Give the child the undivided card and say, "Feel this piece of card carefully. I have another piece exactly the same which I have cut into two. I shall give you the two pieces, and I want you to fit them together again so as to make the same shape as the card you are feeling." As with other tests involving

manipulation, blind children vary greatly in their ability to perform this test. It is not till the age of 13 that two-thirds of the children are successful, yet some children of 5 or 6 may succeed.

Haines used for this test two blocks of wood $2\frac{1}{2} \times 4$ ins., $\frac{1}{2}$ in. thick, but bevelled to $\frac{1}{4}$ in. at the edges. One of these was cut along the diagonal. The pieces were laid on the table thus :— ◢◤. The bevel prevents an apparent fit when one piece is turned over. The blind subject gets the two pieces off the table and manipulates them up near his face. Four 10-year-olds, and twenty-five older (up to 21) were all successful.

6. NAMING THE DAYS OF THE WEEK.—Binet makes ability to name the months in order one of his tests for 9 years. Ability to name the days of the week in their proper order comes two or three years earlier. We may grade it as a six-year test.

7. REVERSING FIGURES.—Say to the child, "I am going to say two numbers to you. Listen carefully, and then say the same numbers backwards. Thus, if I say 3, 4, you must say 4, 3. Now listen—2, 7." If the child succeeds in reversing the numbers, try again with three, then with four numbers, and so on. One success out of three trials for each set of three counts a pass. The average number of figures which the blind children tested could reverse were: at 5 years two, at 7 years three, at 11 years four, and at 13 years five.

8. SUGGESTION TEST.—This test was used as a substitute for Binet's test in which the child is asked which is the longer of each of six pairs of lines. Five weights all of equal size and of the same appearance were used, but weighing respectively 6, 9, 12, 15, and 15 grammes. These we may call A, B, C, D, D'. Two weights were taken and one put into each of the child's hands, and the child was asked "Which is the heavier?" Both weights were then taken from the child, mixed with the others behind a screen, and the process repeated six times altogether. The pairs used in succession were AD', BD', CD', DD', DD', and DD', the weight D' being put back into the same hand on each occasion. This test did not turn out to be satisfactory. Very few of the children tested, even at the higher ages, were successful. (Haines, for this test, made use of cubes of different sizes. A subject who resisted the suggestion that the right cube was the larger twice out of three times (trials 4, 5, and 6) by giving either left larger or both the same, was counted

successful. At 10 years, five of seven passed; at 11, six of six.)

9. FINGER-TAPPING TEST.—This test is suggested by Irwin, and is based on the Knox Cube Test, which is as follows:—

Material.—Five wooden cubes.

Method.—Place four of these upon the table between the examiner and the subject. The cubes are placed about 3 ins. apart, in a line parallel with the subject's front. Say to the subject: "Do you see these cubes? Now, please watch closely, and do exactly as I do." The examiner now taps out with the 5th cube the lines as indicated. The taps are half a second apart. Having tapped out a line, he places the 5th cube upon the table near the subject.

Key to Lines.—Cube 1 is to the right of the examiner and to the left of the subject.

A. 1-2-3-4.	X. 1-2-3-4-3.	B. 1-3-2-4.	E. 1-3-2-4-3.	H. 1-4-3-1-2-4.
	Y. 1-2-3-4-2.	C. 1-4-3-2.	F. 1-4-3-2-4.	I. 1-3-2-4-1-3.
		D. 1-4-2-3.	G. 1-3-1-2-4.	J. 1-4-2-3-4-1.

Scoring.—If the subject begins by making wrong moves, but corrects himself, it is correct. The following test is proposed as being adapted for the blind:—

"Have the subject place upon his thigh his left hand, or the hand other than that of preference, with the palm upward and the fingers spread well apart. Take a pencil, and touch as you would touch the cubes for the seeing subject, his four fingers, the index finger of the hand corresponding to cube 1. The time between taps should be as in the directions in the Knox Cube Test, half second between taps. His instructions should be given by means of line A as an illustration. 'Do you feel these touches? Note the order. Now, attend closely and do exactly as I do.' Then hand him the pencil.

"This is a very novel procedure to many blind children, and with young children line A must be repeated several times before the subject learns the procedure expected of him."

This test was tried on a number of blind children, but further observations are necessary before an opinion can be expressed as to its value.

10. SIMILARITY TEST.—This is a modification of one of Binet's Tests for the age of 8 years, in which the child is expected to tell the *difference* between objects named—a fly and a butterfly; wood and glass; paper and cloth.

Say to the child, "You know what coal is?"—"And wood?" "Very well; tell me any way in which coal and wood are alike." If the child states the difference between coal and wood, do not say he is wrong, but say, "Now, listen again. Tell me how coal and wood are alike." Young children often persist in telling the difference. Question the child in the same way with respect to a ball and an orange; an apple and a banana. This test is a little more difficult than the difference test. It may be graded as a nine- or a ten-year-old test. Of nine-year-old blind children three-fourths passed, of ten-year-old children, eleven out of twelve. Two correct answers to the three sets constitutes a pass. Only one likeness is required in each case. Haines required three correct replies to five pairs. His results make this a high ten-year-old test for the blind.

11. PLAYING SHOP. — One of Binet's nine-year-old tests consists in playing shop, the child being required to give change for a shilling. For this test the following may be substituted in the case of blind children.

Material.—Three small cubes and three larger ones.

Method.—Say to the child, "Would you like to play at shop? Very well, you will be shopkeeper. You have here three little blocks which cost a halfpenny each, and here you have three big ones which cost a penny each. If I buy them all how much will you charge me?" Place one of the child's hands on the small blocks, and the other on the large ones. This may be graded tentatively as a nine-year-old test. Children as young as six were correct in their reply, but several ten-year-old children failed.

12. SHOWS EXAMINER'S RIGHT HAND.—This and the next are new and non-standardised tests suggested by Irwin.

Method.—Have the subject seated facing the examiner with the knees of the latter within easy reach of the subject. Say to him, "My knees are opposite your knees. My hands are on my knees. I am going to ask you a question. Think carefully before answering. Do not answer until I say 'All right.'" Then say, "Show me *my right* hand; now wait and think." Emphasise "my" and "right." After five or six seconds, say, "All right, now show me." After he has done this, say, "Show me my left hand." A new test, not standardised. Record answers.

Irwin suggests 11 years as appropriate for this test, which may be correct. Among the children tested the proportion of passes in successive years varied irregularly. Two

children of 5 were tested and both were correct, while children of 12 and 13 failed. Perhaps the older children are more apt than the younger to respond impulsively without stopping to think. Hence the necessity of warning the child not to reply until the signal "All right" is given. Haines considers this a six- or seven-year test, but he did not test a sufficient number of children to justify such an opinion—only one child of 7, and none of 6; a few at higher ages.

13. ORIENTATION TEST.—"The subject, standing, is faced to the north and told he is facing north. He is then asked to point to the east, west, and south. Draw a rectangle upon the record sheet. Mark it north, and draw arrows pointing in the directions which he points for east, west, and south, marking them E., W., and S., mapwise. In like manner face the subject east, tell him he is facing east and ask him to point south, north, and west. Draw another rectangle upon the record sheet, marking it east, and draw arrows indicating the directions in which he pointed for south, north, and west. A new and non-standardised test. Record results."

This test also is graded by Irwin as appropriate for 11 years. This is really a school test, the grading of which must depend upon the age at which the children begin the study of geography. Of thirty-three children tested, the youngest successful was 10 years of age. Of five ten-year-old children, three were successful.

14. FABLES AND THEIR MORALS.—A simple fable with an obvious moral is told to the child, who is then asked to say what lesson the story is intended to teach. Thirty-eight children were tested. In sixteen cases from one to three fables were told to the children individually and the child gave his answer verbally; in twenty-two cases the fables were told or read to the children in class and the children were asked to write their answers immediately after hearing each fable. This is a fairly high-grade test. No child under 11 was able to give a single correct generalisation, and the only child who gave correct generalisations in all three cases was 14 years of age.

The fables used were—(1) The Fox and the Crow; (2) The Milkmaid; and (3) The Stork and the Cranes.

Method.—Say to the child or children:—

"A fable is a story which is meant to teach a lesson. I am going to read you a fable. Then I shall ask you to tell me what lesson you think the fable is intended to teach.

"1. *The Fox and the Crow.*—One day a crow found a fine piece of meat and flew into a tree carrying the meat in her beak. The fox wanted the meat, and ran to the tree, and began talking to the crow, saying, 'Oh, Mrs Crow, I hear you have a beautiful voice. People say it is lovely. Do let me hear you sing.' On hearing this the crow was greatly pleased, and opened her mouth to try to sing. Immediately the meat fell to the ground, and the fox ran away with it.

"2. *The Milkmaid.*—A milkmaid was going to market carrying a pail of milk on her head. She began thinking to herself, 'With the money I get for this milk I shall buy some eggs. I shall put these under the hens, and get a lot of chicks. When the chickens grow, I shall sell them and buy a fine dress. Then I shall go to balls and parties, and all the young fellows will want to marry me. But I shall be very proud and have nothing to say to them, but will just toss my head like this.' And she tossed her head, and down fell her pail, and all the milk was spilled.

"3. *The Stork and the Cranes.*—A farmer was greatly annoyed by the cranes coming to steal his corn, so he set a trap to catch them. When he came again, he found he had caught not only some cranes, but a stork. The stork, seeing the farmer, called out, 'Oh, Mr Farmer, I hope you will spare me. I am not a thief, and it is quite by accident that you caught me. Do let me go.' But the farmer said, 'Oh, no. I have caught you along with these robbers, and you must die with them.'"

This test is doubtless affected by school instruction, but unless the children have actually heard the fables and been instructed as to their significance, they do not appreciate their meaning until their intelligence is well developed. In fact, it seems to require what one may call an "early adolescent intelligence" to appreciate the fable and apply its lesson to human life in the form of a generalisation. Many children who do not really appreciate the true meaning of a fable will yet give a generalisation of some kind, and it has been suggested that approximately full marks should be given in such cases (*e.g.* four marks out of five), the answer being held to indicate a capacity for generalisation and therefore a fairly advanced intelligence. A study of the actual replies of the children, however, shows that such an easy rule for indicating the value of the answers is not applicable. In some cases a general answer is pure nonsense, while in many more an unimpeach-

able moral generalisation is given by children who do not understand the fable in the least, but who, being asked for a moral, repeat any maxim which they have learned which seems to them likely to please the questioner. As an example of this sort of reply the following may be quoted. A boy of 9 says that the "'Fox and the Crow' teaches us to be kind to our enemies and to love them." This is nearly as wide of the mark as the reply of a seeing child who wrote, "This story is to teach us where to put our commas and full stops."

(*To be continued.*)

A BINET SCALE FOR THE BLIND.

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(*Continued from page* 31.)

PART II.—THE SUGGESTED SCALE.

The tests are to be applied in a quiet room, preferably in the forenoon, when the child is not tired. The "Directions to Examiners" detailed in the Appendix to the English translation of Binet and Simon's *Mentally Defective Children* are to be carefully followed. It is essential that the examiner should be familiar, by practical experience, with the method of testing normal children, and should know the kind of responses normal children give to the various tests. What one wishes to discover is how the blind child under examination compares with the average normal child of the same age. The comparison is with the average normal seeing child, not with a hypothetical average blind child. It has already been pointed out that blind children belong to several categories. Standards for these categories do not at present exist.

The caution that the examiner must be careful not to ally himself on the side of the child, and help him by hints or explanations beyond those given in the directions for the individual tests, is even more necessary in the case of the blind than in the case of seeing children. If the child does not understand the question without any special explanation he has failed. Again, if a child succeeds partially with tests he should not, as a general rule, receive any credit at all. Half or quarter credits should not be given. Occasionally, when a child almost succeeds with several tests, it may appear that a fairer indication of his mental level is obtained by allowing some credit than by calling all the partial successes failures, but in the great majority of cases the rule to avoid partial credits should be adhered to.

Another point that deserves mention is the tendency among children to automatisms. This tendency is sometimes encouraged by the examiner's apparent satisfaction with any kind of answer. Thus a child who finds that his statement that "a fork is silver" (IX, 2) is accepted may go on to say, "a table is wood," "a chair is wood," "a horse is flesh," "a mother is flesh."

A child who is quite capable of giving answers superior to the "use" type may yet adopt the "use" type for all his replies simply because his first reply happened to be "A fork is for eating." In such a case, when the examiner thinks that the child has not done himself justice, it is allowable, after completing the examination, to repeat the test again, without giving any further explanation or hinting that the previous replies were unsatisfactory, but giving the parts of the test in a different order, *e.g.* by asking first "What is a horse?"

The Tests.

THREE YEARS.

1. Say "Show me your eyes"; "Show me your nose"; "Show me your mouth."

Count the child correct if he indicates in any way that he understands.

Be sure you don't help the child in any way. Do not make any sign or gesture indicating what is to be done. The chief object of the test is to discover whether the child can understand spoken language. If the child simply holds up his face to be looked at, say, with emphasis, "Yes, but *which* are your eyes?" "*Which* is your nose?" "*Which* is your mouth?" Don't give the child credit unless he points out the parts asked for.

2. Say, "I am going to say two numbers. Say them after me: 3, 7"—"Again, 6, 4"—"Again, 0, 5."

The examiner must say the figures slowly; an interval of half a second should be allowed between the two. The child passes if he is successful once out of the three trials.

3. Say, "What is your name?"

For a pass the surname must be given, but if the child says his Christian name only, the examiner may press him by asking, "What else?" Do not ask, "What is your father's name?" That is a more difficult question at this level. The child might legitimately answer, "He is called Daddy."

4. "Say this sentence after me: 'I am cold and hungry.'"

If the child is timid he may be tried first with shorter sentences. A sentence containing six syllables should be remembered at this level.

Defective pronunciation should be noted, but give the child credit if he pronounces the words intelligibly. At this level perfect articulation is not to be expected.

Four Years.

1. If the subject is a boy, say, "Are you a little boy or a little girl?" If she is a girl, say, "Are you a little girl or a little boy?" The object of reversing the questions is to avoid obtaining a correct answer from echolalia.

In some cases, the question may be divided: "Are you a little boy?" "Are you a little girl?" If this is done, both questions must be given, as some children will say "yes" to any question asked.

2. Say, "What is this?"—"And this?"—"And this?"

The examiner shows the child successively a key, a penny, and a knife. Other *familiar* objects may be substituted, *e.g.* a boot, a spoon, a plate. In the case of some institution children the last-named objects are preferable to the three selected by Binet. Slight deviations from accuracy may be accepted, *e.g.* if the child calls a penny "money" or even a "ha'penny"; but all three objects must be named.

3. "I am going to say three numbers. I want you to repeat them. Listen: 2, 7, 5." "Again, 9, 0, 4." "Again, 3, 8, 1."

One success suffices. (See III., 2.)

4. Give the child two sticks, *e.g.* two pieces of pencil respectively 4 and 6 cm. long. Place one piece in each of the child's hands, and say, "One of these sticks is longer than the other. Give me the long one." Repeat the test, reversing the position of the sticks. If the child asks if he may place them together, say, "If you like," but don't, of course, tell him to do this. To pass, the child must be correct both times.

Five Years.

1. Say, "Here are two weights. They are the same size, but one is heavier and one is lighter. Give me the heavier one"; or, "Give me the heavy one?" Two boxes or two weighted corks of exactly the same shape and size, but weighing respectively 3 and 12 grammes, are used. The test is repeated with two weighing 6 and 15 grammes. As this is a test of sensory discrimination, the child should be told to hold out his hands, and one weight should be placed in each. The heavier weight is to be placed alternately in the right and the left hand. To pass, the child must be correct in both trials.

When this test is given to a very young normal child, he is apt to respond by pointing haphazard to one of the weights

without weighing them. As to this, Binet says, "We are indulgent and readily pass over this naïve blunder, which is explained sometimes by the thoughtlessness of the child, or by suggestibility, or by a desire to please us, and we say to him, "No, that is not right. You must take the two boxes in your hand and weigh them." No doubt it renders the test somewhat easier to place the weights in the child's hands as directed above; but against this is the fact that any test involving even slight manual dexterity is more difficult for a blind child than for a normal one.

2. Say, "Listen to this, and repeat it after me: 'My name is Charlie. Oh! the naughty dog!'"

If the child's pronunciation is defective, give credit if all the syllables are given. Memory of a sentence containing ten syllables after hearing it once is required. Sometimes a child impulsively begins to repeat before the examiner has finished. Defective children are particularly apt to do this. In such a case say, "Don't speak till I have finished. Now, listen to this." Then give an alternative sentence, or rather (following Binet's example) two disconnected phrases, *e.g.*, "His name is Thomas. It is a fine day."

3. Say, "Here are some pennies. Count them and tell me how many there are." Four pennies are laid on the table, touching, but not superposed. They must not be laid down so that the child can hear them being arranged.

4. Reversing two figures. Say, "I am going to say two figures and I want you to say the same two figures, but backwards. If I say 3, 4, you must say 4, 3; if I say 7, 2, you must say, 2, 7. Now listen carefully: '1, 4.' 'Again, 9, 2.' 'Again, 5, 7.'" One success suffices. If the child makes a mistake, don't say he is wrong, but say, "Now listen again, and when you have heard the figures, repeat them backwards, now." Pause for one second between the figures.

Six Years.

1. "Is it morning or afternoon?" Little children naturally regard "morning" and "afternoon" as synonymous with before and after dinner. Consequently, if a child who has dinner at 1 P.M. is examined at 12.15 and says, "It is morning" or "It is forenoon," he should be counted correct.

2. "What is a fork?" "What is a table?" "A chair?" "A horse?" "A mamma?" At this age it suffices if the child

states the use of the object, namely, *e.g.*, "A fork is for eating with"; "A chair's what you sit on." If the child simply repeats "A chair is a chair," he is marked minus. If he points to or touches a chair, saying, "That's one," his answer is not acceptable, but as it is intelligent the examiner should say, "Yes, but tell me, What *is* a chair?" A *definition* of some kind is what is asked for. Repetition, *e.g.* "It is a chair" counts a failure.

3. "Count these pennies." Thirteen pennies are placed on the table in a group (not in a line) touching one another, but not superposed.

4. "Here are two pieces of cloth. Take one in each hand, feel them, and show me which feels nicer." Use successively (*a*) serge and silk, (*b*) velvet and serge, (*c*) velvet and carpet. The child must be right three times (*vide* Aesthetic Test, p. 25).

Seven Years.

1. "Show me your right hand." "Show me your left ear." A quite spontaneous correction should be accepted, but care must be taken to give no hints. If the child touches one hand with the other so that it is not clear which he means, say, "Hold up your right hand."

2. "How many fingers have you on your right hand?" "How many on your left hand?" "How many altogether?" The child must answer all three questions correctly without any hesitation. He must not stop to think, or be allowed to count his fingers. (From Binet's 1908 scale.)

3. Reversing three numbers—*e.g.*, 2, 9, 5; 3, 6, 1; 7, 5, 8. See V., 4.

4. "If to-day were Friday, what day would yesterday be?" Try again, using two other days. Two correct answers suffice.

Eight Years.

1. "You know what paper is?" "And cloth?" "Are they exactly like each other?" "Very well, tell me in what way they are not alike."

The same questions are asked about an orange and a ball; and wood and glass. Two comparisons must be given correctly. One difference in each case will suffice. Some children take a long time to think about these questions. Two minutes may be allowed as the limit for the test.

2. "You can count, can't you?" "Well, will you count for me backwards from twenty to nothing? Begin 20, 19 . . . "

One error is allowed, but the task must be finished in thirty seconds.

Binet allows only twenty seconds for this task, but this appears to be too little. Moreover, he gives no precise directions as to when to begin to count the same. Some allowance may also in fairness be made for children who are naturally deliberate. Even the suggested limit of thirty seconds may be read as "*about* thirty seconds."

3. "Can you tell me what day it is?" "And will you tell me the date also?"

The year must be given; three or four days' latitude is allowed in the day of the month.

If the child gives the day and month only, the examiner may add, "And what year is it?"

4. "I am going to say five numbers. Listen and repeat them after me": "5, 8, 2, 9, 1." "Again, 3, 7, 5, 2, 0." "Again, 1, 3, 7, 2, 9." One success suffices.

NINE YEARS.

1. "What is a fork?" "What is a table?" "A chair?" "A horse?" "A mother?"

For a pass three at least of the definitions must be given in a form superior to the "use" type. (See VI., 2.)

2. "Will you tell me the names of the months in order?"

Do not give the child a start by naming a month. The child may start with any month he likes.

One omission or one inversion is allowed to pass.

3. "What should you do if you missed a train?" "What should you do if one of your playmates should hit you without meaning to do so?" "What should you do if you broke something belonging to someone else?"

For a pass two at least of these questions must be answered sensibly.

4. "You know an orange?" "And a ball?" "Well, in what way are they like each other?" The same questions are asked about wood and coal, and an apple and a banana. In at least two cases correct *resemblances* must be given. If the child replies, "They are not like each other," the examiner should say, "Oh yes, in some ways they are alike. Now, tell me, how are they like each other?"

TEN YEARS.

1. "I am going to say six numbers to you, and I want you

to repeat them after me." "Now, 6, 1, 8, 3, 7, 2." "Again, 7, 3, 6, 9, 1, 5." "Again, 9, 3, 1, 4, 8, 2." One success suffices.

2. "I am going to read you some sentences, each of which contains something foolish. Listen attentively and tell me each time what is foolish."

The examiner reads the sentences impressively, but without any special emphasis on the part the child should comment on. Each time when he finishes he changes his tone, and demands, "What is foolish in that?"

Sentences.—(1) An unfortunate bicycle rider fell on his head and was killed instantly; he was taken to a hospital, and they fear he will not recover.

(2) I have three brothers—Paul, Ernest, and myself.

(3) The body of an unfortunate young girl, cut into eighteen pieces, was found yesterday on the fortifications. It is thought that she killed herself.

(4) There was a railway accident yesterday, but it was not a bad one; the number of dead is only forty-eight.

(5) Someone said: If I should ever grow desperate and kill myself, I will not choose Friday because Friday is an unlucky day, and will bring me unhappiness. Three satisfactory answers are required.

3. "What would you do if you were going to school and thought you were late?" (The only acceptable answer is one implying "I would hurry.") "What would you do before taking part in something very important?" "Why is a bad action done when one is angry more excusable than the same action done when one is not angry?" "What would you do if you were asked your opinion of someone whom you did not know well?" "Why should one judge a person by his acts rather than by his words?" Three sensible answers should be given.

4. "I am going to read you three words, and I want you to make a sentence and use in it the three words. The words are Paris, fortune, stream."

The expression "make a sentence" must not be further explained, but the instructions may be repeated. For a pass the sentence should be well co-ordinated. At this stage it may contain two distinct ideas, but not three; at the higher level it must contain only one idea (See XII., 2). One minute is the time allowed.

Twelve Years.

1. "I am going to say four numbers, and I want you to repeat them in the reverse order." Give an example, then say, "Now,

2, 9, 5, 3." "Again, 6, 1, 8, 4." "Again, 7, 3, 9, 5." One success suffices.

2. "I am going to read you three words. I want you to make a sentence and use in it the three words. The words are Paris, fortune, stream." For directions see X., 4.

3. "I am going to allow three minutes, and I want you to say as many words as you can think of. Some children have said more than two hundred. Let us see how many you can do. Ready? Start." In order to pass, the child must say over sixty words.

4. "What is Charity?" "What is Justice?" "What is Kindness?" Two correct responses are required.

Charity.—The answer should contain two ideas:—(1) Kindness (2) to someone in need. *Justice.*—If the child says "a judge," say, "Yes, but when we speak of doing justice, what does 'justice' mean?" The answer must contain the idea of persons treated according to their deserts. *Kindness.*—The answer must imply the doing of good acts to others. "Kindness is being kind" is not an acceptable answer. Repeat the question.

Fifteen Years.

1. "I am going to say seven numbers to you, and I want you to repeat them after me. Now, 5, 2, 7, 9, 1, 6, 0." "Again, 6, 4, 1, 3, 9, 7, 5." "Again, 8, 0, 4, 2, 7, 3, 6." One success suffices.

2. "Do you know the meaning of the word 'rhyme'? Two words are said to rhyme when they have similar endings, such as hour and flower, or candy and dandy. Do you understand? Now, find all the words which rhyme with day."

The child is required to find three rhymes in one minute.

3. To tell the moral of simple fables (see p. 29).

4. To reverse given numbers (see XII., 1). *E.g.*, "3, 6, 4, 9, 1." "8, 1, 5, 2, 9." "1, 8, 3, 6, 4."

This scale provides four tests for each year, whereas the Binet-Simon Scale provides five. Various alternative tests which have been tried successfully on blind children might have been included in the scale, but this would have involved having an unequal number of tests for the different ages. The advantage of having the same number of tests for each age is that one can adopt the same system of marking as is used with the ordinary Binet-Simon Scale. That is to say, the mental

age of the child is the highest age all the tests for which are passed, plus one year for every four tests passed from higher ages.

Binet and other Tests with year assigned.

Designation of Test.	Binet, 1911. Normal Children.	Goddard. Normal Children.	Terman. Normal Children.	Haines. Blind Children.	Drummond. Blind Children.
1. Comparison of Weights: 6 and 15 and 9 and 18 grammes	V.	V.	V.	Below VII.	V.
2. Definitions superior to Use	IX.	IX.	IX.	X.	IX.
3. Difference between two things	VIII.	VIII.	VIII.	VIII.?	VIII.
4. Resemblances between two things	...	...	...	...	IX.
5. Counting 20 to 1 . .	VIII.	VIII.	VIII.	VIII.?	VIII.
6. Day and Date . .	VIII.	IX.	IX.	X. +	X.
7. Memory 5 digits. . .	VIII.	VIII.	VII.	...	VIII.
8. „ 6 „ . .	...	X.	X.	VIII.?	X.
9. „ 7 „ . .	XV.	XII.	XIV.	X.	XII.
10. „ 8 „ . .	...	...	XVIII.	XVI.?	...
11. Naming Months . .	IX.	IX. (1 omiss.)	X. (0 omiss.) (3 checks)	VIII.? (3 checks)	VIII.
12. Comprehension 3rd degree (*i.e.* B.'s questions IX. 5)	IX.	...	VIII.	IX.	VIII.
13. Comprehension 4th degree (*i.e.* B.'s questions X. 4)	X.	...	XI.	XII.	XV.?
14. Arranging Weights .	X.	IX.	X.	X. +	X.
15. Absurdities . . .	X. (3 of 5)	XI. (3 of 5)	XI. (4 of 5)	XI. (3 of 5) XIV. (4 of 5)	X.
16. Three words in two sentences	X.	X. half succeed XI. all succeed	... IX.	XI. XII. (3 in 1)	XII.
17. Sixty words in three minutes	XII.	XI.	XI.	X.	XII.
18. Defines three abstract terms (B. XII. 4)	XII.	XII.	XII.	XI. (1 of 3) XIV. (3 of 3)	XII.
19. Disarranged sentences .	XII.	XII.	XII.	XIV.	...
20. Rhymes . . .	XV.	XI.	IX.	X.	XII. +
21. Problems . . .	XV.	XII.	XIV.	...	XVI.?
22. King and President (B. Adult)	Adult	Adult	XVI.	XV.	...
23. Comparison of sticks of 4 and 6 centimetres	...	...	...	...	IV.
24. Aesthetic Test . .	...	...	...	...	VI.
25. Reversing 2 numbers .	...	...	...	...	V.
26. Reversing 3 numbers .	...	...	...	...	VII.
27. Reversing 4 numbers .	...	...	...	...	XII.
28. Reversing 5 numbers .	...	...	...	...	XV.
29. Giving moral of fables .	...	...	...	...	XV.

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